

SEQUENCE LISTING

<110> Leung, Shawn Shui-on

<120> REDUCING IMMUNOGENICITIES OF IMMUNOGLOBULINS BY
FRAMEWORK-PATCHING

<130> 655

<140> US 09/892,613

<141> 2001-06-27

<160> 71

<170> PatentIn version 3.3

<210> 1

<211> 369

<212> DNA

<213> Artificial Sequence

<220>

<223> FR-patched heavy chain variable region sequence (Full DNA
Sequence) formed by joining the N- and C- terminal (SEQ 3 and 6)
halves at the KpeI site.

<220>

<221> V_region

<222> (1)..(369)

<400> 1

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gaagtgcagc tgctggagtc tgggggaggc ttagtcagc ctggagggtc cctgaggctc      60
tctgtgcag cctctgatt ctccttcagt atctatgaca tgtcttgggt tcgccaggca      120
ccgggaaagg ggctggagtg ggtcgatac attagtagtg gtggtgttac cactactat      180
ccagacactg tgaagggccg attcaccatc tccagagaca atgccaagaa ctcctgtac      240
ctgcaaatga acagctctgag ggtggaggac acagccttat attactgtgc aagacatagt      300
ggctacggta gtactacagg ggtttgttt gcttactggg gccaaaggac tctggtcact      360
gtctcttca                                     369
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<210> 2

<211> 123

<212> PRT

<213> Chimaera sp.

<400> 2

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Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1           5           10          15
```

```
Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Ser Phe Ser Ile Tyr
20          25          30
```

```
Asp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35          40          45
```

```
Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro Asp Thr Val
50          55          60
```

```
Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
65          70          75          80
```

```
Leu Gln Met Asn Ser Leu Arg Val Glu Asp Thr Ala Leu Tyr Tyr Cys
85          90          95
```

```
Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu Phe Ala Tyr
100         105         110
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Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115         120
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<210> 3

<211> 111

<212> DNA

<213> Artificial Sequence

<220>

<223> N-template is a synthetic sense-strand oligonucleotide encoding
amino acids 14-50 of the VH region (SEQ ID No. 2). The template
is PCR-amplified by two primers (SEQ ID No. 4 and 5)

<220>

<221> V_region

<222> (1)..(111)

<400> 3

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cctggagggt ccctgaggct ctctgtgca gcctctggat tctccttcag tatctatgac      60
atgtcttggg ttccgcaggc accgggaaag gggctggagt gggtcgcata c          111
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<210> 4
 <211> 57
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 1-19 of the VH region (SEQ ID No. 2). The 3' end of the primer overlaps with the 5' end of the template by 18 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(57)

<400> 4
 gaagtgcagc tgctggagtc tgggggaggc ttagtgcagc ctggagggtc cctgagg 57

<210> 5
 <211> 48
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 43-59 of the VH region(SEQ ID No. 2). The primer overlaps with the template by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(48)

<400> 5
 gtagggtgta ccaccaccac tactaatgta tgcgaccac tccagccc 48

<210> 6
 <211> 132
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> C-terminal is a synthetic sense-strand oligonucleotide encoding amino acid 68-111 of the VH region (SEQ ID No 2) The template is PCR-amplified by two primers (SEQ ID No 7 and 8)

<220>
 <221> V_region
 <222> (1)..(132)

<400> 6
 ttaccatctc ccagagacaa tgccaagaac tccctgtacc tgcaaatgaa cagtctgagg 60
 gtggaggaca cagccttata ttactgtgca agacatagtg gctacggtag tagctacggg 120
 gttttgtttg ct 132

<210> 7
 <211> 60
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 55-74 of the VH region (SEQ ID No 2). The 3' end of the primer overlaps with the 5' end of the template by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(60)

<400> 7
 ggtggtacca cctactatcc agacaactgtg aagggccgat tcaccatctc cagagacaat 60

<210> 8
 <211> 57
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 105-123 of the VH region (SEQ ID No 2). The primer and the template overlaps by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(57)

<400> 8
 tgaagagaca gtgaccagag tcccttgccc ccagtaagca aacaaaaccc cgtagct 57

<210> 9
 <211> 321
 <212> DNA
 <213> Artificial Sequence

<220>
<223> FR-patched light chain variable region sequence formed by joining the N- and C- terminal (SEQ ID No. 11 and 14) halves at the KpeI site.

<220>
<221> V_region
<222> (1)..(321)

<400> 9
gatatccaga tgaccagtc tccatctcc ctgtctgct ctgtgggaga cagagtcacc 60
attagttgca gggcaagtc ggacattagc aattatttaa actggtatca gcagaaccca 120
ggtaaggctc cgaactcct gatctactac actagtatat tacactcagg agtcccatca 180
aggttcagtg gcagtgggtc tggacagaa ttactctca ccattagctc cctgcagcca 240
gaagattttg ccacttactt ttgccaacag ggtaatcgc ttccgtggac gticggtgga 300
ggcaccaagg tggaaatcaa a 321

<210> 10
<211> 107
<212> PRT
<213> Chinaera sp.

<400> 10

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Asn Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 11
<211> 108
<212> DNA
<213> Artificial Sequence

<220>
<223> N-template is a synthetic sense-strand oligonucleotide encoding amino acid 11-46 of the VL region (SEQ ID No. 10). The template is PCR-amplified by two primers (SEQ ID No. 12 and 13)

<220>
<221> V_region
<222> (1)..(108)

<400> 11
ctgtctgctt ctgtgggaga cagagtcacc attagttgca gggcaagtc ggacattagc 60
aattatttaa actggtatca gcagaaccca ggtaggctc cgaactc 108

<210> 12
<211> 51
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 1-17 of the VH region (SEQ ID No. 10). The 3' end of the primer overlaps with the 5' end of the template by 21 nucleotides.

<220>
<221> primer_bind
<222> (1)..(51)

<400> 12
gatatccaga tgaccagtc tccatctcc ctgtctgctt ctgtgggaga c 51

<210> 13
<211> 40
<212> DNA
<213> Artificial Sequence

<220>

<223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 40-53. The primer and the template overlaps by 18 nucleotides.

<220>
<221> primer_bind
<222> (1)..(40)

<400> 13
atatactagt gtagtagatc aggagtttcg gagccttacc 40

<210> 14
<211> 120
<212> DNA
<213> Artificial Sequence

<220>
<223> C-terminal is a synthetic sense-strand oligonucleotide encoding amino acid 59-98 of the VH region (SEQ ID No 10). The template is PCR-amplified by tow primers (SEQ ID No 15 and 16)

<220>
<221> V_region
<222> (1)..(120)

<400> 14
ccatcaaggc tcagtagcag tgggtctgga acagaattta ctctcccat tagctccctg 60
cagcagaag attttgccac ttacttttgc caacagggtg atacgcttcc gtggacgttc 120

<210> 15
<211> 49
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 50-65 of the VH region (SEQ ID No. 10). The 3' end of the primer overlaps with the 5' end of the template by 21 nucleotides

<220>
<221> primer_bind
<222> (1)..(49)

<400> 15
ctacactagt atattacact caggagctccc atcaagggtc agtggcagt 49

<210> 16
<211> 48
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 92-107 of the VH region (SEQ ID No 10). The primer and the template overlaps by 21 nucleotides.

<220>
<221> primer_bind
<222> (1)..(48)

<400> 16
tttgatttcc accttggtgc ctccaccgaa cgtccacgga agcgtatt 48

<210> 17
<211> 371
<212> DNA
<213> Artificial Sequence

<220>
<223> FR-patched heavy chain variable region sequence (Full DNA Sequence) formed by joining the N- and C- terminal (SEQ 19 and 22) halves at the KpeI site.

<220>
<221> V_region
<222> (1)..(371)

<400> 17
cagggtgcaac tgggtgcttc cggggctgag gtaataagc ctggggcctc agtgaaggtc 60
tcctgcaagg cttctggcta cacatttacc agttacaata tgcactgggt acggcagcct 120
cctggaaggg gcctggaatg gattggagct attatccag gaaatggtga tactagttac 180
aatcagaaat tcaaggggcaa ggccacattg actgcagaca aatctccag cacagcctac 240
atgcagctca gcagctctgac atctgaggac tctgcggtct attactgtgc aagatcgcac 300
tacggtagta actacgtaga ctactttgac tactggggcc aaggcaccac tgttacagtc 360
tcctctgata a 371

<210> 18
<211> 123

<212> PRT
 <213> Chimaera sp.
 <400> 18
 Gln Val Gln Leu Val Ala Ser Gly Ala Glu Val Asn Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Asn Met His Trp Val Arg Gln Pro Pro Gly Arg Gly Leu Glu Trp Ile
 35 40 45
 Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe
 50 55 60
 Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
 65 70 75 80
 Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ser His Tyr Gly Ser Asn Tyr Val Asp Tyr Phe Asp Tyr Trp
 100 105 110
 Gly Gln Gly Thr Thr Val Thr Val Ser Ser Asp
 115 120
 <210> 19
 <211> 114
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> N-template is a synthetic sense-strand oligonucleotide encoding
 amino acid 12-49 of the VH region (SEQ ID No. 18). The template
 is PCR-amplified by two primers (SEQ ID No. 20 and 21)
 <220>
 <221> V_region
 <222> (1)..(114)
 <400> 19
 aataagcctg ggcctcagt gaaggtctcc tgcaaggctt ctggctacac attaccagt 60
 tacaatatgc actgggtacg gcagctctct ggaaggggcc tggaatgat tggg 114
 <210> 20
 <211> 57
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> 5' Primer is a synthetic sense-strand oligonucleotide encoding
 amino acid 1-19 of the VH region (SEQ ID No 18). The 3' end of
 the primer overlaps with the 5' end of the template by 24
 nucleotides.
 <220>
 <221> primer_bind
 <222> (1)..(57)
 <400> 20
 caggtgcaac tggtagcttc cgggctgag gtaataagc ctggggcctc agtgaag 57
 <210> 21
 <211> 55
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> 3' Primer is a synthetic anti-sense-strand oligonucleotide
 encoding amino acid 43-60 of the VH region (SEQ ID No 18). The
 primer and the template overlaps by 21 nucleotides.
 <220>
 <221> primer_bind
 <222> (1)..(55)
 <400> 21
 tgaactagt atcaccattt cctggataaa tagctccaat ccattccagg cccct 55
 <210> 22
 <211> 126
 <212> DNA
 <213> Artificial Sequence
 <220>
 <223> C-terminal is a synthetic sense-strand oligonucleotide encoding
 amino acid 70-111 of the VH region (SEQ ID No 18) The template is
 PCR-amplified by tow primers (SEQ ID No 23 and 24)

<220>
 <221> V_region
 <222> (1)..(126)
 <400> 22
 ttgactgcag acaatcctc cagcagacc tacatgcgc tcagcagtct gacatctgag 60
 gactctgcgg tctattactg tgcaagatcg cactacggta gtaactacgt agactacttt 120
 gactac 126

<210> 23
 <211> 61
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 57-76 of the VH region (SEQ ID No 18). The 3' end of the primer overlaps with the 5' end of the template by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(61)
 <400> 23
 tgatactagt tacaatcaga aattcaaggg caagggcaca ttgactgcag acaatcctc 60
 c 61

<210> 24
 <211> 59
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 105-123 of the VH region (SEQ ID No 18). The primer and the template overlaps by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(59)
 <400> 24
 tgatcagagg agactgtaac agtggcgcct tggcccccagt agtcaaagta gtctacgta 59

<210> 25
 <211> 321
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> FR-patched light chain variable region sequence (Full DNA Sequence) formed by joining the N- and C- terminal (SEQ 27 and 30) halves at the BspEI site.

<220>
 <221> V_region
 <222> (1)..(321)
 <400> 25
 gatattcaac tcacacagtc tccatcaagt ctttctgcat ctgtggggga cagagtcaca 60
 attacttgca gggccagctc aagtttaagt ttcatgcact ggtaccagca gaagccagga 120
 tctccccca aaccctggat ttatgccaca tccaacctgg ctccaggagt ccctagtcgc 180
 ttcagtggca gtgggtctgg gaccgagttc actctcaca tcagcagttt gcagcctgaa 240
 gatttcgcca cttattttctg ccatcagtgg agtagtaacc cgctcacgtt cgtgctggg 300
 accaagctga ccgttctacg g 321

<210> 26
 <211> 107
 <212> PRT
 <213> Chimaera sp.

<400> 26
 Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
 1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Ser Leu Ser Phe Met
 20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr
 35 40 45

Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
 50 55 60

Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu
65 70 75 80

Asp Phe Ala Thr Tyr Phe Cys His Gln Trp Ser Ser Asn Pro Leu Thr
85 90 95

Phe Gly Ala Gly Thr Lys Leu Thr Val Leu Arg
100 105

<210> 27
<211> 129
<212> DNA
<213> Artificial Sequence

<220>
<223> N-template is a synthetic sense-strand oligonucleotide encoding amino acid 9-51 of the VL region (SEQ ID No. 26). The template is PCR-amplified by two primers (SEQ ID No. 28 and 29)

<220>
<221> V_region
<222> (1)..(129)

<400> 27
tcaagtcttt ctgcatctgt gggggacaga gtcacaatta ctgcagggc cagctcaagt 60
ttaagtttca tgcactggta ccagcagaag ccaggatcct cccccaacc ctggatttat 120
gccacatcc 129

<210> 28
<211> 45
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 1-15 of the VH region (SEQ ID No 26). The 3' end of the primer overlaps with the 5'end of the template by 21 nucleotides.

<220>
<221> primer_bind
<222> (1)..(45)

<400> 28
gatattcaac tcacacagtc tccatcaagt cttctgcat ctgtg 45

<210> 29
<211> 40
<212> DNA
<213> Artificial Sequence

<220>
<223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 45-57. The primer and the template overlaps by 21 nucleotides.

<220>
<221> primer_bind
<222> (1)..(40)

<400> 29
ggactccgga agccaggttg gatgtggcat aaatccaggg 40

<210> 30
<211> 120
<212> DNA
<213> Artificial Sequence

<220>
<223> C-terminal is a synthetic sense-strand oligonucleotide encoding amino acid 61-100 of the VH region (SEQ ID No 26) The template is PCR-amplified by tow primers (SEQ ID No 31 and 32)

<220>
<221> V_region
<222> (1)..(120)

<400> 30
ttcagtgcca gtgggtctgg gaccgagttc actctacaa tcagcagttt gcagcctgaa 60
gatttcgcca cttatttctg ccatcagtg agtagtaacc cgctcacgtt cggtgctggg 120

<210> 31
<211> 43
<212> DNA
<213> Artificial Sequence

<220>
<223> 5' Primer is a synthetic sense-strand oligonucleotide encoding amino acid 54-67 of the VH region (SEQ ID No 18). The 3' end of the primer overlaps with the 5'end of the template by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(43)
 <400> 31
 ggcttcgga gtccttagtc gcttcagtg cagtgggtct ggg 43

<210> 32
 <211> 42
 <212> DNA
 <213> Artificial Sequence

<220>
 <223> 3' Primer is a synthetic anti-sense-strand oligonucleotide encoding amino acid 94-107 of the VH region (SEQ ID No 26). The primer and the template overlaps by 21 nucleotides.

<220>
 <221> primer_bind
 <222> (1)..(42)
 <400> 32
 ccgtagaacg gtcagcttgg tccagcacc gaacgtgagc gg 42

<210> 33
 <211> 123
 <212> PRT
 <213> Antibody

<400> 33
 Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
 1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser Ile Tyr
 20 25 30

Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
 35 40 45

Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro Asp Thr Val
 50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
 65 70 75 80

Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr Tyr Cys
 85 90 95

Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu Phe Ala Tyr
 100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ala
 115 120

<210> 34
 <211> 107
 <212> PRT
 <213> Antibody

<400> 34
 Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
 1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Asn Tyr
 20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile
 35 40 45

Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
 50 55 60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
 65 70 75 80

Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
 85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
 100 105

<210> 35
 <211> 123
 <212> PRT

<213> Immunoglobulin

<400> 35

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Lys Pro Gly Gly
1 5 10 15

Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Ala Phe Ser Ile Tyr
20 25 30

Asp Met Ser Trp Val Arg Gln Thr Pro Glu Lys Arg Leu Glu Trp Val
35 40 45

Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro Asp Thr Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr Leu Tyr
65 70 75 80

Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr Tyr Cys
85 90 95

Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu Phe Ala Tyr
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ala
115 120

<210> 36

<211> 29

<212> PRT

<213> Immunoglobulin

<400> 36

Glu Val Gln Leu Val Glu Ser Gly Gly Gly Leu Val Pro Gly Gly Ser
1 5 10 15

Leu Arg Leu Ser Cys Ala Thr Thr Gly Phe Ala Phe Ser
20 25

<210> 37

<211> 30

<212> PRT

<213> Immunoglobulin

<400> 37

Gln Val Gln Leu Val Glu Ser Gly Gly Gly Val Val Gln Pro Gly Arg
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Ser Phe Ser
20 25 30

<210> 38

<211> 30

<212> PRT

<213> Immunoglobulin

<400> 38

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Ser Phe Ser
20 25 30

<210> 39

<211> 14

<212> PRT

<213> Immunoglobulin

<400> 39

Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val Ala
1 5 10

<210> 40

<211> 32

<212> PRT

<213> Immunoglobulin

<400> 40

Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr Leu Gln
1 5 10 15

Met Asn Ser Leu Arg Val Glu Asp Thr Ala Leu Tyr Tyr Cys Ala Arg
20 25 30

<210> 41
<211> 11
<212> PRT
<213> Immunoglobulin

<400> 41

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Thr
1 5 10

<210> 42
<211> 107
<212> PRT
<213> Immunoglobulin

<400> 42

Asp Ile Gln Met Thr Gln Thr Thr Ser Ser Leu Ser Ala Ser Leu Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Asn Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Asp Gly Thr Val Lys Leu Leu Ile
35 40 45

Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Asp Tyr Ser Leu Thr Ile Ser Asn Leu Glu Gln
65 70 75 80

Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

Thr Phe Gly Gly Gly Thr Lys Leu Glu Ile Lys
100 105

<210> 43
<211> 23
<212> PRT
<213> Immunoglobulin

<400> 43

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys
20

<210> 44
<211> 15
<212> PRT
<213> Immunoglobulin

<400> 44

Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile Tyr
1 5 10 15

<210> 45
<211> 32
<212> PRT
<213> Immunoglobulin

<400> 45

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Glu Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Phe Cys
20 25 30

<210> 46
<211> 10
<212> PRT
<213> Immunoglobulin

<400> 46

Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
1 5 10

<210> 47
<211> 123
<212> PRT
<213> Immunoglobulin

<400> 47

Glu Val Gln Leu Leu Glu Ser Gly Gly Gly Leu Val Gln Pro Gly Gly
1 5 10 15

Ser Leu Arg Leu Ser Cys Ala Ala Ser Gly Phe Ser Phe Ser Ile Tyr
20 25 30

Asp Met Ser Trp Val Arg Gln Ala Pro Gly Lys Gly Leu Glu Trp Val
35 40 45

Ala Tyr Ile Ser Ser Gly Gly Gly Thr Thr Tyr Tyr Pro Asp Thr Val
50 55 60

Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Ser Leu Tyr
65 70 75 80

Leu Gln Met Asn Ser Leu Arg Val Glu Asp Thr Ala Leu Tyr Tyr Cys
85 90 95

Ala Arg His Ser Gly Tyr Gly Ser Ser Tyr Gly Val Leu Phe Ala Tyr
100 105 110

Trp Gly Gln Gly Thr Leu Val Thr Val Ser Ser
115 120

<210> 48
<211> 107
<212> PRT
<213> Immunoglobulin

<400> 48

Asp Ile Gln Met Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Ser Cys Arg Ala Ser Gln Asp Ile Ser Asn Tyr
20 25 30

Leu Asn Trp Tyr Gln Gln Lys Pro Gly Lys Ala Pro Lys Leu Leu Ile
35 40 45

Tyr Tyr Thr Ser Ile Leu His Ser Gly Val Pro Ser Arg Phe Ser Gly
50 55 60

Ser Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro
65 70 75 80

Glu Asp Phe Ala Thr Tyr Phe Cys Gln Gln Gly Asn Thr Leu Pro Trp
85 90 95

Thr Phe Gly Gly Gly Thr Lys Val Glu Ile Lys
100 105

<210> 49
<211> 123
<212> PRT
<213> Immunoglobulin

<400> 49

Gln Val Gln Leu Arg Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala
1 5 10 15

Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
20 25 30

Asn Met His Trp Val Lys Gln Thr Pro Gly Gln Gly Leu Glu Trp Ile
35 40 45

Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe
50 55 60

Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
65 70 75 80

Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
85 90 95

Ala Arg Ser His Tyr Gly Ser Asn Tyr Val Asp Tyr Phe Asp Tyr Trp
100 105 110

Gly Gln Gly Thr Thr Leu Thr Val Ser Ser Asp
115 120

<210> 50
 <211> 107
 <212> PRT
 <213> Immunoglobulin
 <400> 50
 Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala Ser Pro Gly
 1 5 10 15
 Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Leu Ser Phe Met
 20 25 30
 His Trp Tyr Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr
 35 40 45
 Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
 50 55 60
 Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val Glu Ala Glu
 65 70 75 80
 Asp Ala Ala Thr Tyr Phe Cys His Gln Trp Ser Ser Asn Pro Leu Thr
 85 90 95
 Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys Arg
 100 105
 <210> 51
 <211> 123
 <212> PRT
 <213> Immunoglobulin
 <400> 51
 Gln Val Gln Leu Arg Gln Pro Gly Ala Glu Leu Val Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Met Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr Ser Tyr
 20 25 30
 Asn Met His Trp Val Lys Gln Thr Pro Gly Gln Gly Leu Glu Trp Ile
 35 40 45
 Gly Ala Ile Tyr Pro Gly Asn Gly Asp Thr Ser Tyr Asn Gln Lys Phe
 50 55 60
 Lys Gly Lys Ala Thr Leu Thr Ala Asp Lys Ser Ser Ser Thr Ala Tyr
 65 70 75 80
 Met Gln Leu Ser Ser Leu Thr Ser Glu Asp Ser Ala Val Tyr Tyr Cys
 85 90 95
 Ala Arg Ser His Tyr Gly Ser Asn Tyr Val Asp Tyr Phe Asp Tyr Trp
 100 105 110
 Gly Gln Gly Thr Thr Leu Thr Val Ser Ser Asp
 115 120
 <210> 52
 <211> 30
 <212> PRT
 <213> Immunoglobulin
 <400> 52
 Gln Val Gln Leu Val Ala Ser Gly Ala Glu Val Asn Lys Pro Gly Ala
 1 5 10 15
 Ser Val Lys Val Ser Cys Lys Ala Ser Gly Tyr Thr Phe Thr
 20 25 30
 <210> 53
 <211> 14
 <212> PRT
 <213> Immunoglobulin
 <400> 53
 Trp Val Arg Gln Pro Pro Gly Arg Gly Leu Glu Trp Ile Gly
 1 5 10
 <210> 54
 <211> 32
 <212> PRT
 <213> Immunoglobulin
 <400> 54

Arg Val Thr Ile Thr Ala Asp Lys Ser Thr Ser Thr Ala Tyr Met Glu
1 5 10 15

Leu Ser Ser Leu Arg Ser Glu Asp Thr Ala Val Tyr Tyr Cys Ala Arg
20 25 30

<210> 55
<211> 32
<212> PRT
<213> Immunoglobulin

<400> 55

Arg Ala Thr Ile Ser Val Asp Thr Ser Lys Asn Gln Phe Ser Leu Asn
1 5 10 15

Leu Ser Ser Val Thr Ala Ala Asp Thr Ala Val Tyr Cys Cys Ala Arg
20 25 30

<210> 56
<211> 11
<212> PRT
<213> Immunoglobulin

<400> 56

Trp Gly Gln Gly Thr Thr Val Thr Val Ser Ser
1 5 10

<210> 57
<211> 107
<212> PRT
<213> Immunoglobulin

<400> 57

Gln Ile Val Leu Ser Gln Ser Pro Ala Ile Leu Ser Ala Ser Pro Gly
1 5 10 15

Glu Lys Val Thr Met Thr Cys Arg Ala Ser Ser Ser Leu Ser Phe Met
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Ser Ser Pro Lys Pro Trp Ile Tyr
35 40 45

Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ala Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Ser Tyr Ser Leu Thr Ile Ser Arg Val Glu Ala Glu
65 70 75 80

Asp Ala Ala Thr Tyr Phe Cys His Gln Trp Ser Ser Asn Pro Leu Thr
85 90 95

Phe Gly Ala Gly Thr Lys Leu Glu Leu Lys Arg
100 105

<210> 58
<211> 23
<212> PRT
<213> Immunoglobulin

<400> 58

Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys
20

<210> 59
<211> 22
<212> PRT
<213> Immunoglobulin

<400> 59

Asn Leu Met Leu Ile Gln Pro Pro Ser Val Ser Glu Ser Pro Gly Lys
1 5 10 15

Thr Val Thr Met Thr Cys
20

<210> 60
<211> 15
<212> PRT
<213> Immunoglobulin

<400> 60

Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Pro Val Ile Tyr
1 5 10 15

<210> 61
<211> 32
<212> PRT
<213> Immunoglobulin

<400> 61

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Glu Phe Thr
1 5 10 15

Leu Thr Ile Ser Ser Leu Gln Pro Glu Asp Phe Ala Thr Tyr Phe Cys
20 25 30

<210> 62
<211> 32
<212> PRT
<213> Immunoglobulin

<400> 62

Gly Val Pro Ser Arg Phe Ser Gly Ser Gly Ser Gly Thr Asp Phe Thr
1 5 10 15

Leu Thr Ile Thr Ser Leu Gln Pro Glu Asp Phe Ala Ala Tyr Phe Cys
20 25 30

<210> 63
<211> 32
<212> PRT
<213> Immunoglobulin

<400> 63

Gly Val Pro Ser Arg Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Phe
1 5 10 15

Leu Thr Ile Ser Ser Leu Arg Pro Glu Asp Val Ala Thr Tyr Phe Cys
20 25 30

<210> 64
<211> 32
<212> PRT
<213> Immunoglobulin

<400> 64

Gly Val Pro Ala Arg Phe Ser Gly Tyr Asn Ser Gly Asn Ser Ala Phe
1 5 10 15

Leu Thr Ile Asn Arg Val Glu Ala Gly Asp Glu Ala Asp Tyr Phe Cys
20 25 30

<210> 65
<211> 11
<212> PRT
<213> Immunoglobulin

<400> 65

Phe Gly Gly Gly Thr Lys Val Glu Ile Lys Arg
1 5 10

<210> 66
<211> 11
<212> PRT
<213> Immunoglobulin

<400> 66

Phe Gly Val Gly Ser Lys Val Glu Ser Lys Arg
1 5 10

<210> 67
<211> 11
<212> PRT
<213> Immunoglobulin

<400> 67

Phe Gly Ala Gly Thr Lys Leu Thr Val Leu Arg
1 5 10

<210> 68
<211> 122
<212> PRT
<213> Immunoglobulin

<400> 68

Gln Val Gln Leu Val Ala Ser Gly Ala Glu Val Asn Lys Pro Gly Ala

<210> 71

<211> 107

<212> PRT

<213> Immunoglobulin

<400> 71

Asp Ile Gln Leu Thr Gln Ser Pro Ser Ser Leu Ser Ala Ser Val Gly
1 5 10 15

Asp Arg Val Thr Ile Thr Cys Arg Ala Ser Ser Ser Leu Ser Phe Met
20 25 30

His Trp Tyr Gln Gln Lys Pro Gly Gln Ala Pro Val Pro Val Ile Tyr
35 40 45

Ala Thr Ser Asn Leu Ala Ser Gly Val Pro Ser Arg Phe Ser Gly Ser
50 55 60

Gly Ser Gly Thr Glu Phe Thr Leu Thr Ile Ser Ser Leu Gln Pro Glu
65 70 75 80

Asp Phe Ala Thr Tyr Phe Cys His Gln Trp Ser Ser Asn Pro Leu Thr
85 90 95

Phe Gly Ala Gly Thr Lys Leu Thr Val Leu Arg
100 105